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Prognostic Value of Urochromogen and Red-Cell Sedimentation Reactions and Leucocytes in Tuberculosis.—As an index of increased protein destruction the positive urochromogen reaction occurs only in the final stages of tuberculosis, with the possible exception of individual cases of transient perifocal inflammation. The colorless potassium persulphate, in place of the highly colored potassium permanganate, as test reagent is advised. In addition to the urochromogen reaction the blood-sedimentation quotient and white-blood picture are recommended as prognostic aids in sanatorium practice. In the blood-sedimentation reaction the quotient of Wahl-Schömberg is recommended as of value. This quotient $\frac{a}{b-a}$ (*a* being the 1-hour and *b* the 2-hour value) when above 1 is favorable and when below 1 unfavorable prognostically. In determining the white blood picture the monocytes must also be considered, a diminution below 5 per cent being unfavorable.—*Der prognostische Wert von Urochromogenreaktion, Blutsenkungs-geschwindigkeit und Blutbild für die heilstätte, Becker, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 726.*—(*H. J. C.*)

Lymphocytosis and Pulmonary Tuberculosis.—The prognostic value of lymphocytosis during autogenous serum, protein therapy and tuberculin treatment is emphasized.—*Lungentuberkulose und Lymphocytose, J. Weicksel, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 967.*—(*H. J. C.*)

Protective Inoculation with "BCG."—The authors summarize briefly the principal experimental facts and observations established and numerous previous attempts, covering a quarter of a century, to effectively vaccinate against tuberculosis. The first attempts naturally followed the lines of those successfully used by Pasteur with rabies and other infections, or else the use of soluble toxins produced by cultures of the bacilli,—methods analogous to those used in diphtheria and tetanus to produce antitoxins. But none of these substances were found capable of conferring an appreciable resistance on animals inoculated later with virulent bacilli. The diaplyte vaccine, pro-

posed by Dreyer, and composed of defatted bacilli, was likewise found ineffective. Behring in 1902 was undoubtedly the first to propose a method contemplating the preventive vaccination of young calves by intravenous inoculations of human bacilli. In France the Society of Veterinary Medicine carried on experiments along this line, which were directed by Rossignol and Vallée. The results were doubtful and indicated only a very slight, if any, increase in resistance. Also, these methods presented real dangers for man, because human bacilli prepared as *Bovovaccine* appear capable at times of persisting in virulence for a long time in the lymph nodes and might even be found later in the milk of the vaccinated cows (Titze and Griffith). Next we consider various other acid-fast bacilli, so called *paratubercle bacilli*, such as Moeller's bacillus, Friedmann's bacillus, etc. These were shown to have no vaccinating power for mammals. Ferran of Barcelona in 1898 believed the tubercle bacilli to be pleomorphic and transmutable, and his collaborators, chiefly Vacarazza, at Buenos Aires, evolved a vaccine, *Anti-alpha*, with which they have vaccinated subjects of all ages. This vaccine appears to be relatively harmless, and probably acts in a nonspecific way to promote phagocytosis, being made up of various protein products. No relation has ever been proved between the "alpha bacilli" of Ferran and the tubercle bacillus, and up to the present time no experimental fact prompts us to doubt the specificity of the tubercle bacilli, despite the recent claims of Vaudremer (1923) and Valtis (1924–1925), who claim that there exist in tuberculous products and cultures on artificial media minute, invisible or microscopic elements capable of passing through porcelain filters or through the female placenta. *I: Mechanism of Antituberculous Immunity: Phenomena of Protection*: The preceding resumé shows that it is only with tubercle bacilli, more or less virulent and living, that it is possible to confer artificially on sensitive animals a particular state of resistance to subsequent infection which characterizes antituberculosis immunity. Early experiments had shown it possible to successfully vaccinate young calves by the digestive route by making them absorb in two ingestions, repeated at 48-hour intervals, a small quantity of living human tubercle bacilli, provided these vaccinated animals later avoided accidental infection until a sufficient immunity had developed. It has even been possible to make some animals resistant to an ordinarily fatal dose by making them absorb human bacilli attenuated by heating five minutes to 70°C. Following these observations it had been thought that it would perhaps be possible to protect young children from natural tuberculous infection by making them ingest shortly after birth a small quantity of human and bovine tubercle bacilli, modified by heat and mixed with milk. It was then stated: "The sole essential precaution necessary and which will not be always easy to secure will consist of keeping these vaccinated children for four months or more away from all tuberculous contamination. For this purpose nurses will be required to watch over the newly born of tuberculous parents." The desideratum then formulated was realized in 1920 by *L'oeuvre du placement familiale des tout-petits*, due to Léon Bernard and Mme. A. Seligman and also by *L'oeuvre Grancher*. These early experiments establish the fact that *infection of young animals occurs much more surely by the digestive tract than by any other route*. The absorptive power of the digestive tract becomes much reduced several weeks after birth and very greatly so in adolescent or adult subjects. It has been proved that the gravity of the disease is a function of the frequency and intensity of contaminations and the number and virulence of the bacilli. A single infection, even quite massive, may be cured, while animals submitted to two or more successive reinfections by the digestive tract, repeated at short intervals, are never cured. The cured animals are no longer susceptible at least for a certain time, to reinfection, even though made to ingest much larger quantities of virulent bacilli. They may be said to have been vaccinated. *Animals naturally or artificially infected with weak doses of bacilli are incomparably more resistant than new animals to the effects of intravenous inoculation*. It is a fact long since suspected that certain forms or localizations of spontaneous tuberculosis appear to confer a resistance toward later infections. In 1886 Marfan arrived at the conclusion that lupus and scrofula, when cured, protected against a new infection. Koch in 1891 noted that tubercle bacilli, inoculated subcutaneously, act differently on a guinea pig already tuberculous than on a sound animal. The same difference was observed when bacilli killed by heat or by chemical agents were inoculated, and this has been termed the *Koch phenomenon*. Tuberculin tests have shown that bacillary infection is almost inevitable quite early in life, especially in large urban populations. At Paris 35 per cent of apparently sound children at the age of five have been infected; at Vienna 94 per cent by the age of 12 (Hamburger); in rural Germany Roemer found 66 per cent of children infected before 11 years. It is thus exceptional for one to arrive at adult

age and escape any infection. It has been noted that the mortality from tuberculosis is very frequent in early life. In the hospitals in Paris 28 per cent of deaths up to the age of 16 are due to tuberculosis. *Therefore, in early childhood family contagions, almost inevitable in the infants of phthisical mothers, are the most grave and frequently fatal because massive and frequently repeated.* After the third year these contagions are less formidable. Then are more apt to occur accidental contaminations, intermittent attacks which most often produce benign lymphatic lesions and which are frequently curable. It appears that for man, as for tuberculizable animals, such as cows, an early but slight infection may be desirable on condition that it is not followed by other frequent or massive infections. One may say that any subject infected during early life by a weak dose of bacilli becomes unlikely to contract acute tuberculosis. If later exposed to repeated or massive contagion, he will manifest his resistance to reinfections by becoming phthisical or by developing suppurating local lesions. There is no doubt that the lymphatic system, particularly developed in early life, opposes an effective barrier to the infection of the organism by the tubercle bacilli. Slight infections, not repeated, are more benign in children than in adults who have remained virgin soil. That is why country dwellers who have migrated after adolescence into the cities so often develop rapidly fatal forms of tuberculosis and also why the blacks of the African regions, where tuberculous infection has not yet penetrated, seem to be so susceptible when transported into European countries. Meditation on these facts led the authors to the conclusion that it would never be practical or possible to vaccinate adult or adolescent subjects in an environment which is heavily infected, as are our cities, as every attempt at vaccination of such subjects with living bacilli risks provoking phenomena of intolerance (Koch phenomena), and these phenomena would be capable of expressing themselves by a caseification and a rapid softening of preëxisting tuberculous lesions, resulting in a heavy discharge of virulent bacilli into the lymphatic or blood circulation. This objection would hold for every method which utilizes bacilli of human or animal origin, as long as they preserve the faculty of forming tubercles. Therefore the authors sought a technique tending to modify hereditarily the physicochemical constitution of the tubercle bacilli without injuring its vitality or its antigenic properties. After many attempts they found, in pure bile combined with 5 per cent glycerine, a substance extremely alkaline and rich in lipoids, a medium which seemed to render successive cultures less and less tuberculogenic. These cultures, recultured every two weeks on the same medium, were no longer virulent at the end of four years for the ox or the guinea pig. They were still so for the horse and the rabbit. After 23 successive cultures over three years under identical conditions at 38°C. the bacilli had lost all tuberculogenic properties and all virulence for domestic mammals and poultry. One might inject considerable quantities of fine emulsion into the veins or cause the bacilli to be absorbed by mouth without provoking the least accident and without there being formed the least tuberculous lesion. Injected subcutaneously in a dose of 5 mgm. in the guinea pig they produced a small cold abscess which healed rapidly, without leaving any trace except a slight subcutaneous induration. One never observed any lymphatic swelling, the animals remaining well, and autopsy after six months or more never disclosed any trace of visceral tuberculous lesion, proving that the bacillus, called *BCG* for convenience (*Bacille Calmette-Guérin*), had lost its tuberculogenic properties and of its virulence additional proof is furnished by the fact that successive reinoculations in different laboratory animals never resulted in restoration of its original qualities. These experiments showed that with the nontuberculogenic bacillus one might confer on young animals, free from preëxisting tuberculosis, the same resistance to reinfections that they acquire from slight infections or latent or occult infection. This state of resistance to reinfection is not confined to tuberculosis, the chief new departure being that such resistance is bound up with the persistence of the vaccination germs in the lymphatic organs. One observes the same fact in certain other diseases of slow evolution, such as syphilis and probably leprosy. Sergent, Parrot and Donatien have proposed the term *Prémunition* (protection or prefortification). The authors therefore call this protection against virulent tuberculous infection. Such protection vanishes when the bacilli, whether attenuated or virulent, are completely eliminated. It may be said that protection against bacillary infection in infected surroundings can only be utilized in very young subjects by as early impregnation as possible of the lymphatic system with the living nontuberculogenic bacilli. The authors' previous publications have shown that this impregnation can be practically realized by a single intravenous or subcutaneous injection, or by several oral administrations, or a suitable dose of the vaccine. Subjects thus protected react to virulent infections just as

those who have been spontaneously or artificially infected with weak doses in early life and are carriers of benign tuberculous lesions. *2: Experimental Results of Attempts at Protection by BCG of Susceptible Mammals: a: Rabbits and Guinea Pigs:* By slow intravenous injections of a single dose of 25 to 30 mgm. of *BCG.*, finely emulsified, one may protect effectively a rabbit of 2.5-kgm. weight against a tuberculous infection fatal in 50 to 75 days for controls (0.001 mgm. of Vallée's culture of bovine bacilli), but the resistance thus conferred wanes after the sixth month, although not disappearing entirely. In guinea pigs, up to 100 mgm. of *BCG*, at a single intravenous injection can be administered without impairing their health, but 30 mgm. furnishes equally good protection. Subcutaneous or intraperitoneal injections of *BCG*, in the rabbit have a very doubtful efficacy. On the other hand, young rabbits from 15 to 20 days old may be protected by oral administration with a pipette, five to ten times at 24-hour intervals, of 20 mgm. of *BCG*, or a total of 100 to 200 mgm. If they are injected three months afterward at the same time as controls with a dose of 1 mgm. of virulent bacilli, they survive longer, and those which die present more discrete and less extensive lesions. Rabbits protected intravenously or subcutaneously react to tuberculosis after the fifteenth day, and continue to react positively up to the eighth month. Protection of the guinea pig is more difficult because of the extreme sensitiveness of this animal to infections of every sort, which seem to be aggravated by inoculation with tubercle bacilli. One can, however, obtain it in the adult guinea pig by a single intracardiac inoculation of 5 to 10 mgm. of *BCG* or by two subcutaneous injections of 50 mgm., each at two-month intervals, or by administering orally with a pipette at ten meals at 24-hour intervals 100–150 mgm. of *BCG*, in an emulsion of which 0.2 cc. contains four hundred million bacilli. The proof of the protected guinea pigs, either by intracardiac or subcutaneous injection, can be shown from two to four months later by ocular instillations of a drop of a fine emulsion of a virulent culture containing 0.001 mgm. of Vallée's bovine bacilli, or, in the case of guinea pigs protected by oral administration, by the administration, after three months with a pipette of one or two doses. of 1 mgm. of the same culture. In either case the results are satisfactory, but, as in the rabbit, one notices that from the sixth month the protection wanes and the bacilli introduced into the body seem to recover their infective power. Adult guinea pigs protected by the subcutaneous route react to tuberculin after the fifteenth day. Young ones protected by ingestion, as described, react almost constantly from the thirty-second to the forty-seventh day. *b: Calves:* The facts here established have been fully confirmed by all who have repeated our experiments on young calves. In newborn calves, and in them only, protection is conferred by a single inoculation of 50 to 100 mgm. of *BCG*, with a syringe into the connective tissue of the dewlap. This is renewed at the expiration of each year. Experiments are being carried out in different countries, especially in the United States under the auspices of the Bureau of Animal Industry, also in Great Britain, Italy, Belgium and Holland. In France the work has been left to the initiative of the veterinary practitioner. Thirty-four of these have kindly offered their coöperation, and have chosen localities certainly infected, in which they have systematically vaccinated all the animals shortly after birth; none after the second week. The number of vaccinations thus carried out with emulsions of *BCG* from September, 1924, to May, 1925, was 668 in France, 311 in England, 145 in Holland, and 181 in Belgium. Vaccinations done by the authors in the departments of Seine-inferieure and Seine-et-Oise were made on 48 calves in 1923, 33 in 1924, and 16 up to May 1, 1925. From the first of January, 1926, the total number of vaccinated calves reached 3,051. Up to the present the authors' collaborators have not reported any untoward results. Growth has been normal and health has remained excellent. The tuberculin reactions have been variable; sometimes positive, sometimes negative in those injected. The authors believe it preferable to refrain from provoking them because certain facts lead them to think that tuberculin, given even intracutaneously, is not entirely inoffensive for animals protected by *BCG*, and sensitizes them toward virulent artificial infections. Also, under the conditions, the tuberculin can be of little diagnostic service. The sole criterion of the existence of tuberculous infection in a vaccinated subject is the presence of tubercles containing bacilli, which may be reinoculated and cause in other susceptible animals progressive tuberculous lesions. It has been observed that in protected animals virulent bacilli, when introduced or absorbed naturally, and whether retained or expelled, still preserve their original biological character and pathogenic properties, so that the protection has affected only the host. As a result, before the protection by *BCG* or any other prophylactic method utilizing living microörganisms, the employment of tuberculin as a diagnostic measure ought to be avoided. Attempts to vaccinate monkeys

with *BCG* were carried out at the Pasteur Institute of Kindia (French Guinea) from 1923 to 1926 by Wilbert on 15 chimpanzees and 59 pithecian apes, with the following results: *1:* Inoculation or ingestion of up to 100 mgm. is perfectly harmless and provokes only a slight and transitory lymphatic swelling. *2:* Animals of all ages were easily immunized, either by a single subcutaneous inoculation of 50 mgm. or by five oral doses of 50 mgm. each in eight to ten days against tuberculous infection from continued close association with contagious artificially infected animals. *3:* The protection conferred does not last over a year. *4:* It may be renewed by reinoculation or oral administration repeated each year. A considerable number of the animals died of dysentery during the last part of the experiment, but none of the vaccinated showed tuberculous lesions at autopsy. *These experiments clearly demonstrate the innocuousness and effectiveness of protection by BCG against close and prolonged contact infection from disseminators of virulent bacilli. 3: Tuberculosis Mortality among Infants under One Year:* In all social strata of old civilizations tuberculosis takes a large number of victims among infants under one year, especially those born of tuberculous mothers, and brought up in contaminated households. It is now believed that the vast majority of cases of both adolescent and adult tuberculosis are a manifestation, more or less delayed or fulminating, of a preëxisting infection contracted at an early age by one or more massive reinfections. As Behring writes, it is almost always "the last verse of a romance sung by the mother or nurse at the cradle." Official statistics are scarce because only in Great Britain and the United States is it obligatory to report deaths from tuberculosis. Some idea of the gravity of the situation, however, may be gained by the deaths reported from tuberculosis in children's hospitals. In about ten leading institutions on the continent of Europe the proportion of all deaths varied between 6.8 per cent at Dresden (Schlossmann) and 31.4 per cent at Breslau (Winkler), with a mean of 19.1 per cent. Pirquet found, of 100 children living in a tuberculous environment, 76 infected by the end of the first year, and recently Roepke has found 40 per cent of positive reactions among children living in contact with negative-sputum tuberculosis cases. Bernard and Debré have found infection to occur in 76.6 per cent of cases by the mother, 16 per cent by the father, and 7.4 per cent by others. An investigation through antituberculosis dispensaries of 80 French Departments has been made regarding known tuberculous families. Their chiefs have been questioned as to how many tuberculous women under surveillance had children in 1922 and were still living January 1, 1925; also as to how many children born of these tuberculous mothers had in this period succumbed to tuberculous or presumably tuberculous affections. From 99 replies the following information resulted: Of 1,362 tuberculous women (248 for Paris and the Department of the Seine) who had children in 1922, only 623, or 46 per cent, (145 for Paris and the Seine) were alive January 1, 1925. Of 1,364 children born of these mothers in 1922, 327 died under one year (24 per cent) of presumably tuberculous infections. In Paris the proportion was 32.6 per cent. It is recalled that Debré and Lelong reported from a much smaller group a mortality of 80 per cent of infantile deaths among those who for some reason could not be separated by the *Oeuvre de placement*, and that Forssner at Stockholm found a mortality of 70 per cent in infants under one year cared for by tuberculous mothers. Other figures are not so high, but it can be certainly affirmed that in France over 25 per cent of children born of tuberculous mothers, brought up in an infected environment, died of tuberculosis during their first year. *4: Attempts at Vaccination of the Newborn:* These were carried out between July, 1921, and January, 1926. It was necessary to select only very young infants, in the first days following birth and still free of any preëxisting tuberculous infection (even so, as shown, this was not always the case), because in infants under two weeks the absorptive powers of the intestinal tract toward microörganisms, antitoxins, etc., is greatest, but diminishes rapidly afterward. In order to test the practicability of the method, the normal conditions of bringing up these infants must not be changed, and they must remain in contact with the contagious mother, the sole precaution being current hygienic measures in order to avoid, if possible, massive infections. The first clinical tests were carried on with the coöperation of Weill-Hallé, in connection with the Maternity Service at *La Charité* Hospital, Paris. Later on other obstetricians also offered their services. The perfect tolerance shown by the infantile alimentary tract for *BCG* led to an increase of the dose up to a total of 0.03 gm., or 1,200,000,000 bacilli. During the year 1922, 217 infants received preventive ingestions, and up to May, 1925, there were known to have died 15 of them, none of a presumably tuberculous infection; among 94 whose state of health was known, all showed normal development and appeared well. Several had remained permanently

in contact with a tuberculous mother. Following a communication in June, 1924, to the Academy of Medicine many physicians sought the vaccine, and from July 1, 1924, to July 1, 1926, there were 5,193 newly born infants vaccinated throughout France with emulsions of *BCG* delivered by the Pasteur Institute. Of these 5,183 protected infants 1,317 have been individually controlled from six to eighteen months. These can be compared with the unvaccinated ones. Among these there have been 107 deaths, 96 of which were due to diverse non-tuberculous affections, and 11 of presumably tuberculous disease. This gives a total of 7.2 per cent, and a tuberculosis mortality of 0.7 per cent. Including only the 586 children who were protected ("pre-fortified") but who remained in contact with bacillus carriers the presumable tuberculosis mortality is 1.8 per cent, instead of 25 per cent, as in the unprotected, or 32.6 per cent, the Paris figures. *Effects of Tuberculin on the Body of the "Protected" Child:* One naturally asks whether tuberculin reactions (cutaneous or intracutaneous) can furnish any indication as to the results of ingestion of *BCG* or the immunity derived from it. The answer would seem to be negative. Positive reactions are obtained in about 6 per cent of "protected" children, negative reactions being the rule, although alternately positive and negative reactions, done at several weeks' interval, are quite common. Experimental work suggests that a tuberculin reaction becomes positive so long as there exists a parasitism between bacilli and cells. This parasitism with *BCG* never goes on to tubercle-formation; it disappears more or less slowly, according to the quantity of vaccine inoculated or absorbed. When the reaction is negative we find no lymphatic or no visceral lesions, although bacilli often occur enclosed in lymphatic cells. Among the 96 deaths due to *nontuberculous* conditions, the commonest causes were congenital weakness (athrepsia or marasmus), gastroenteritis and bronchopneumonia. When one considers the 11 children who died of *presumably tuberculous* conditions the reason for failure appears to be that infection had already occurred before vaccination or before it could become effective. Animal experiments show that this requires several weeks and that for several days both preceding and following vaccination most careful precautions must be taken, for if massive infection then occurs it soon dominates the scene. Hygienic measures and visiting nurses are necessary in the homes of the vaccinated, and if the parents are uneducatable the child must be separated and put "in placement" elsewhere. The histories of some of the children who succumbed even suggested prenatal infection, which is assumed to occur through the placenta, resulting in the very early appearance of deep lymphatic lesions. Certain pulmonary lesions are also seen, which many clinicians falsely consider primary lesions or "chancres of inoculation," assuming them to result from respiratory infection. *5: Attempts at Protection of the Newborn and of Adults in the Colonies and Tropics:* A campaign was undertaken against tuberculous infection in the country or in locations where it is still not widespread, such as the West African Colonies, both by trying to immunize infants and to protect adults recruited for military service, who are often exposed and contaminated in the garrisons in France and Algeria. At the instance of the Medical Inspector General, instructions were sent through the Minister of the Colonies to the Health Service of Senegal, Madagascar and Indo-China, and the Pasteur Institutes at Dakar, Tananarive and Saigon were prepared to reculture *BCG* and make the vaccine. At Dakar an excellent maternity service was functioning and methodical vaccination of the newborn has already been begun, the vaccinated being marked behind the shoulder with a little vermilion tattoo mark. Beginning December, 1924, a similar undertaking was carried out on a larger scale in Indo-China by Bernard and Bablet of the Pasteur Institute at Saigon, aided by others. In neither of these series has there been any untoward event connected with vaccination. By October, 1925, 3,350 children, Annamites and Chinese, had been vaccinated and were under surveillance. Vaccination of adolescents and adults is more delicate, but it was also carried out after two negative cutaneous tuberculin tests at a weekly interval. At first subcutaneous injection of 3 mgm. was employed, but owing to abscess-formation the buccal route was later preferred, 10 mgm. of *BCG* being given three times, with breakfast, at 48-hour intervals. These last trials were at Madagascar and among the Senegalese. *6: Probable Duration of Immunity Conferred by BCG: Revaccination:* Animal experiments with cattle seem to indicate that protection against virulent infection lasts from fifteen to eighteen months. Revaccination, practised at intervals of about a year, are harmless and reinforce the immune state. In the child they are recommended at the end of the first and third years, although here it seems probable that the conferred immunity lasts longer than three years. *Conclusions: 1:* Subjects free from all preëxisting tuberculous infection can be artificially protected against natural or experimental infection by either inoculation or

absorption of a culture of *living*, originally virulent bacilli, whose characteristics have been slowly and hereditarily modified through a long series of cultures on an alkaline medium, such as lipoids (ox-bile), so that it is harmless for mammals and birds and does not cause tubercle-formation, although it is antigenic. *2:* Under experimental conditions *BCG* can effectively protect young cattle and apes against natural or artificial tuberculous infection for over a year. Guinea pigs and other small rodents can be protected for much shorter periods. *3:* The protection of adolescents or adults is possible only in countries where tuberculous infection is rare, and in tuberculin nonreactors. *4:* It is possible to prolong the immunity by revaccinations, preferably by the buccal route. *5:* Following the favorable results obtained in animals the method has been successfully used in infants born of tuberculous mothers. In France, up to January, 1926, 5,183 had been vaccinated by the buccal route. While the mortality from tuberculosis in children under a year old and born of tuberculous mothers is at least 25 per cent, and generally more, that of children protected by *BCG* is under 2 per cent. *6:* This method of protection is harmless and results in no febrile reaction or physiological disturbance. The duration of the immunity conferred appears to be long enough to guard young children up to the age of three years from family contamination if the doses are not too massive. *7:* Such vaccination is advised especially in families whose newborn would be exposed to contact with bacillus carriers. Such vaccination does not do away with the necessity for using hygienic measures or avoiding massive contamination. The technique of preparation of the vaccine is described in some detail and also the way to obtain the vaccine and cultures, and how to employ the former.—*Prémunition des nonveau-nés par le vaccin BCG, A. Calmette, C. Guérin, L. Nègre and A. Boquet, Rev. d. l. Tuberculose, February, 1926, vii, 5.*—*(A. P.)*

Protective Inoculation with "BCG."—A résumé of the conclusions drawn from extensive research to produce an effective vaccine for protection against tuberculosis may be given as follows: *1:* Immunity to tuberculous infection and reinfection can be obtained only by previous infection with living bacilli. *2:* Bacilli used for a vaccine must have antigenic properties, but must be deprived of the power of tubercle formation, even after they have remained for a long time in contact with tissues or organs. *3:* Effective vaccination can be accomplished only in those subjects who have had absolutely no previous tuberculous infection. *4:* This may be done by inoculation, or, in very young infants, by the oral administration of a proper amount of the culture of nontubercle forming bacilli previously described and known as *BCG*. *5:* In a country such as France, where tuberculous infection is widespread, vaccination to be effective should be done during the first ten days of life when the intestine is easily permeable to bacilli. Of the first infants thus vaccinated in 1921 and 1922 none have died of an illness presumably tuberculous. During 1925 the state of health of 94 of these infants living in Paris was investigated. All had grown normally and were in good health, although 17 had remained in contact with tuberculous mothers. From July 1, 1924, to July 1, 1925, 5,183 young infants were vaccinated, not only in Paris but throughout France, with emulsions of *BCG* from the Pasteur Institute. No outward effects attributable to the vaccine were noted. Of these 5,183 cases 1,317 have been carefully observed for six to eighteen months and may be used as a basis for comparison with a group of infants not vaccinated. Of infants born and raised in a tuberculous environment, the mortality during the first year is at least 25 per cent, among those supervised by social-hygiene societies, while among those not supervised it is estimated by Bernard and Debré as about 80 per cent. In the group of 1,317 vaccinated infants there were 106 deaths, and of these 95, or 7.2 per cent, were from diseases presumably nontuberculous and 11, or 0.7 per cent, from tuberculosis. When, for purposes of comparison, calculation is made on the basis of the 586 cases of this vaccinated group that remained in a tuberculous environment, the mortality from tuberculosis is a maximum of 1.8 per cent instead of a minimum of 25 per cent as noted above. It seems, therefore, that vaccination with *BCG* safeguards at least 93 per cent of infants who otherwise would die of tuberculosis during the first year of life. Extensive observations elsewhere, as in Belgium, Indo-China and Africa tend to confirm these observations. Though it appears demonstrated by the group vaccinated in 1922 that immunity may last more than three years, the question arises whether it would not be desirable to revaccinate infants at the end of the first and third years with a sufficient quantity of *BCG* to assure some absorption even though the permeability of the intestine is less. Experiments on cattle and monkeys have shown that vaccination may be repeated harmlessly each year and will augment the immune state. In conclusion, the harmlessness of the method and its good results warrant its general use, es-

pecially in newborn infants in a tuberculous environment. Vaccination will not permit, however, the abandonment of hygienic measures necessary to prevent or minimize infection.—*Résultats des essais de prémunition des nouveau-nés contre la tuberculose par le vaccin BCG 1921 a 1926, A. Calmette, C. Guérin, L. Nègre and A. Boquet, Presse Méd., February 24, 1926, no. 16, 241.*—(*E. H. K.*)

Practical Application of "BCG."—After an extensive discussion of the literature, the author feels justified in making the following statements: The *BCG* bacilli possess constant properties both *in vivo* and *in vitro*. Even after the administration of large amounts of these bacilli orally, subcutaneously, peritoneally, intravenously, or intracardially, no progressive disease develops; whatever lesions may be found undergo complete resorption. The bacilli which may be excreted after immunization are harmless. Observations over several years on a large and varigated material have shown the harmlessness and the efficiency of the procedure. The mortality of infants living in contact with open cases of tuberculosis has been reduced to one-twentieth. It is suggested that Austria use the method, that the preparation of the vaccine be controlled by the Government, and that the distribution be free to physicians.—*Gesichtspunkte zum Schutzeerfahren der Säuglinge gegen Tuberkulose nacht A. Calmette, H. Schroetter, Wien. klin. Wchnschr., February 3, 1927, xl, 151.*—(*M. P.*)

Immunization with "BCG" Vaccine.—During the last three years a number of infants in tuberculous families received 0.25 to 1.0 mgm. of vaccine by subcutaneous injection. First it was ascertained that these children were not infected. No ill effects were observed. A slight local reaction develops which ends with the formation of a small cold abscess, whose contents are discharged; the fistula heals spontaneously. The infants develop a positive tuberculin skin reaction within two to three months. The relative virtues of this method of administration and the optimal dosage deserve further studies.—*Note sur la prémunition du nourrisson contre la tuberculose par injections sous-cutanées de B.C.G., B. Weill-Hallé and Turpin, Meeting, Acad Méd., January 25, 1927, reported in Prog. Méd., February 12, 1927, no. 7, 257.*—(*M. P.*)

Experimental Studies on "BCG" Vaccine.—Forty guinea pigs were injected intraperitoneally with 5 to 10 mgm. of the vaccine. Four months later 13 of these were autopsied and did not show any macroscopic specific tissue alterations. Some of the other animals died at an earlier period of intercurrent diseases. In some of these small cysts were found in the omentum. They contained transparent fluid and *BCG* bacilli. It was never possible to demonstrate caseating processes. Similar observations were made on rabbits which had been injected intravenously with 5 to 15 mgm. of the vaccine. In every case in which organs containing *BCG* bacilli were transplanted into healthy animals, no tuberculous lesions developed. Calmette's statement that the *BCG* bacillus is nonvirulent and not tuberculogenic was fully confirmed by these observations.—*Ueber Schutzimpfung gegen Tuberkulose mit BCG nach Calmette, E. Suarez, Wien. klin. Wchnschr., March 24, 1927, xl, 381.*—(*M. P.*)

Experimental Studies on "BCG" Vaccine.—Fifty guinea pigs were inoculated subcutaneously with 5, 10, and 30 mgm., respectively, of Calmette's vaccine. In all animals a nodule, about the size of a pea, developed at the site of injection, approximately on the 24th day. Histological examination of these nodules, some of which ulcerated, showed typical tuberculous granulation tissue. In 19 animals these nodules receded, and after three to five months they had completely disappeared or left only a thin scar. One animal still had an ulcer after 60 days; in 3 animals caseous areas and chalky lymph nodes, containing tubercle bacilli, were still demonstrable after 140 to 150 days. The regional lymph nodes were regularly enlarged after 24 days. Between the 24th and 60th day central caseation was found. After 120 to 150 days the lymph nodes had but the size of a lentil. But in all animals, killed after five months, typical tissue alterations were found histologically. In a few animals the infection transgressed the regional lymph drainage, and tuberculous foci with bacilli were detected in the omentum, mesenteric lymph nodes, lungs and spleen. About one-half of the inoculated animals were infected with 0.001 mgm. of a virulent bovine bacillus 44 days afterward. All animals developed nodules, the size of a bean, without ulceration. In 8 animals no tuberculous lesions were found in the internal organs; the rest showed internal lesions, which, however, were much less extensive than those in 6 control animals. The vaccine, then, has undoubtedly an immunizing action, which, under the conditions of experiment, was never sufficient to prevent entirely a reinfection. This action is due to the production of tuberculous foci. Calmette's opinion, that the *BCG* strain induces

immunity without the production of tuberculous alterations, cannot be accepted as correct. It is believed that the immunity lasts only as long as the lesions exist, probably too short a time for practical needs.—*Über die Wirkung der Calmetteschen Tuberkulose-Schutzimpfungsstoffe in Meerschweinchenversuchen, H. Selter and W. Blumenberg, Klin. Wchnschr., June 11, 1927, vi, 1134.*—(*M. P.*)

Protective Inoculation of Children with Dead Tubercle Bacilli.—Twenty-six young children and infants in tuberculous surroundings, but themselves not infected, were treated prophylactically with Langer's vaccine of dead tubercle bacilli with no untoward results. In 4 children there developed a harmless scrofuloderma and in one a rise in temperature for two to three weeks, all appearing from two to four months after the protective inoculation. Fourteen of the children, who were very carefully protected against natural infection, developed positive intracutaneous and Pirquet reactions on an average of 2.4 months after the inoculation, the minimum and maximum periods being one and five months. But is there bound up with this allergy a protective influence? Proof of this can come only by a comparison of the incidence of tuberculous disease among those treated and those untreated, and an observation period of ten years will be required. For one reason or another the 26 children were reduced to 19, on whom longer observations were carried out. Of these, 14 were, after treatment, exposed to tuberculous surroundings for one year and 5 for about two years. All of these were carefully examined physically, roentgenographically, etc., every six months, and none showed any evidence, subjective or objective, of tuberculous disease. Intracurrent infections exerted no baneful influence upon the immunity. It would be premature to pass final judgment as to the immunizing effect of this procedure, because the observations were too few in number and of too short a duration. Moreover, the several unknown factors in immunity would prevent one from being too inclusive in deductions. The facts of these observations, however, may speak favorably for the inoculation, and further critical study of Langer's medium is strongly recommended.—*Praktische Ergebnisse mit der Tuberkuloseschutzimpfung nach Langer, I. Zadek and M. Meyer, Deutsche med. Wchnschr., March 11, 1927, liii, 442.*—(*H. S. W.*)

Prevention of Tuberculosis in Childhood.—Opie and McPhedran have shown that massive tuberculosis of the tracheobronchial lymph nodes, recognizable by roentgenological examination, was found thirty-one times in children in 42 families in which there was a case of open tuberculosis. This study of the contagion of tuberculosis in families has definitely shown that latent tuberculosis is contagious both for children and for adults. Though in most instances it remains hidden, it not infrequently produces manifest disease. Statistics of the New York Tuberculosis and Health Association show that in New York City, in 1924, there were 17 deaths from tuberculosis among boys aged from 10 to 14 years, 44 deaths among girls of the same age, 116 deaths among boys of from 16 to 19, and 227 deaths among girls of the same age. The greater tuberculosis mortality among girls may possibly be ascribed to the foolish fad of trying to appear slender. There is urgent need for preventoria for the adolescent child in danger of tuberculosis. Furthermore, a crusade against the fad of undernourishment is timely. Physical condition, also, should be considered in the choice of occupation for young people. Annual periodical health examinations for every adult and child is the greatest safeguard against the development of tuberculosis in children, and, therefore, the most effective means of combating tuberculosis in adults.—*Essentials in Prevention of Tuberculosis in Infancy and Childhood. S. A. Knopf, J. Am. M. Ass., April 2, 1927, lxxxviii, 1058.*—(*W. I. W.*)

Pulmonary Antiseptics.—Pulmonary antisepsis may be obtained in two ways: (1) by the oral administration of drugs which are carried to the lungs through the bloodstream and excreted in a large measure by the respiratory mucosa, and (2) by the direct introduction of the medicament into the respiratory tree. Antiseptics are indicated primarily in all foetid affections of the lungs and bronchi (gangrene, bronchiectasis, foetid bronchitis). They may also be used advantageously in chronic bronchitis, lobar pneumonia, bronchopneumonia, and pulmonary tuberculosis. They may be administered orally, by pulverization, by inhalation, and by intratracheal injection. The preparations themselves may be divided into four main groups: (1) aromatic substances, such as eucalyptus, gomenol, turpentine, tincture of garlic, (2) coal-tar derivatives, such as creosote, guaiacol, thiocol, carbolic acid, (3) sulphur and its derivatives, such as sulphur, sulphuretted waters, sodium hyposulphite, and (4) oxygen. The less potent antiseptics that may be added to the above classification are iodine, tincture of benzoin, and lipiodol.—*Les antiseptiques pulmonaires, M. Blanche, Prog. Méd., May 28, 1927, no. 22, 852.*—(*U. E. Z.*)

Disinfection in Tuberculosis.—A number of chemical disinfectants for use with

sputum are discussed in detail, since the disposal of sputum by burning with the cup is not popular in central Europe. All laundry in contact with patients should be soaked for two hours in a 2 per cent cresol-soap solution. The same solution is recommended for cleaning floors and furniture. Clothes and mattresses should be disinfected by steam. Books and similar objects can be disinfected either in formaldehyde vapors or in a hot-air sterilizer; in private houses one can substitute for the latter a properly controlled baking oven. After a patient is removed from a room, the room is best disinfected by formaldehyde, or, if this proves too expensive, a thorough cleaning with 2 per cent cresol-soap solution may be substituted. The author ends his review with a plea for the general use of pasteurized milk. —*Über die Desinfektionsfragen bei der Tuberkulose, M. Eugling, Wien. klin. Wchnschr., June 30, 1927, xl, 850.*—(*M. P.*)

Disinfection of Tuberculous Excreta.—A series of experiments were conducted (1) to verify whether the action of phenol in the disinfection of moist tuberculous excreta is increased by the addition of neutral salts; (2) to establish the action of Chloramine T, and (3) to control and repeat with larger quantities of sputum the work of other authors with the periodides. Large quantities of fresh and richly bacilliferous material were used and animals were freely used in controlling the work. *Conclusions: 1:* A 5 per cent phenol solution, in a proportion of 2 to 1 with fresh tuberculous sputum, is unable to disinfect the material thoroughly in less than twelve hours. *2:* A 5 per cent phenol in 10 per cent NaCl solution, in a proportion of 2 to 1 with fresh tuberculous sputum, disinfects the material within seven hours. *3:* The substitution of sodium sulphate for sodium chloride in the phenol-saline solution does not increase the minimum time for disinfection. In fact the time is reduced to six hours. *4:* Saline solution, therefore, increases the disinfecting power of phenol and also that of the phenol derivatives (cresol) upon fresh tuberculous excreta. It lowers the former minimum period for disinfection from fourteen hours (Neri-Bofinger) to six and seven hours. The various salts that may be used are, in order of potency, NaSO, NaCl and KSO (Krönig, Paul and Gardenghi). *5:* Chloramine T, in a concentration of 20 to 40 per cent, disinfects within eight hours an equal amount of sputum. A 1 per cent periodide solution is unable to disinfect the material after a contact of one to three hours. *6:* The use in a practical way of the saline-phenol mixture is urged for the disinfection of fresh tuberculous sputum because of the rapidity of its action and its economical preparation.—*Sulla disinfezione chimica degli escreato tubercolari freshi ed umidi, V. Tommasi, Tubercolosi, January, 1927, xix, 1.*—(*U. E. Z.*)

Tuberculosis and Myopia.—The author further supports his previous theory on the tuberculous nature of myopia, to which exceptions have been taken, by: (1) All adults have been infected with tuberculosis according to the observations of Naegeli and Schirp. (2) Myopia belongs to the youthful forms of tuberculosis while pulmonary disease occurs ony at a later period. One who has successfully passed through a prior youthful form of tuberculosis has an immunity, and does not develop pulmonary disease, and for this reason one finds less myopia in the sanatoria. (3) The parallelism between the myopia and tuberculosis curves in Sweden indicates their close relationship. School myopia and heredity is denied by Hirsch. The tuberculous nature of myopia makes possible the healing or cure of shortsightedness.—*Einwendungen gegen "Kurzsichtigkeit und Tuberkulose," G. Hirsch, Ztschr. f. Tuberk., 1926, xlv, 32.*—(*H. J. C.*)

Goitre and Pulmonary Tuberculosis.—According to autopsy statistics relative to patients dead of tuberculosis, sclerosis of the thyroid is very common in advanced tuberculosis. It is a frequent clinical observation that, as tuberculosis advances, the symptoms suggestive of thyroid disturbance show some tendency to improve. Sclerosis of the thyroid found in the advanced stage of tuberculosis is a secondary or late stage of inflammation. It may be supposed that, antedating the sclerosis, there existed toxemic stimulation and inflammatory changes, the latter being always attended with symptoms of thyroid dysfunction. The thyroid apparently possesses some degree of immunity against bacillary invasion and the resulting destructive or fibrotic changes. Even without the aid of statistics it would perhaps be reasonable to conclude that, in a structure as vascular as the thyroid gland, chronic caseous tuberculosis must of necessity be rare. However, tuberculous lesions, do occur. Tubercles in the thyroid are common in cases of military tuberculosis. Rest is the essential element in the treatment of both conditions, and it is possible that some cases of *forme fruste* of exophthalmic goitre, after a rest of from three to six months in a sanatorium, are considered "arrested cases" of pulmonary tuberculosis and the patient is discharged. For the differentiation of these confusing syndromes, clinical judgment and experience are much more important than

refined laboratory procedures. Some authorities believe that "hyperthyroidism" exercises a beneficent influence on tuberculosis. In a disease in which metabolism is already upset, it is difficult to see how goitre with its toxemia and its marked influence on the metabolic rate can possibly have a beneficial effect on tuberculosis, a disease also characterized by prolonged toxemia. *Summary:* The rather frequent coexistence of goitre and tuberculosis is not sufficiently appreciated. Diagnostic difficulties are great owing to the similarity of the clinical picture in the two diseases. The sequence of pathological changes in the thyroid explains the relative severity of the two diseases at different periods. Three types of diagnostic problems occur in early cases: (1) the incipient case of tuberculosis, without demonstrable pulmonary lesion, resembling exophthalmic goitre, (2) the *forme fruste* type of exophthalmic goitre resembling early tuberculosis, and (3) a coexistence of tuberculosis and goitre, a coexistence of the two diseases which is comparatively frequent, as shown by statistics. The following types of cases are sometimes surgical: (1) chronic tuberculosis with toxic goitre, (2) arrested tuberculosis with toxic goitre, and (3) acute cumulative toxemia resulting from coexisting pulmonary tuberculosis and toxic goitre. *Treatment:* For early cases, a medical regimen, such as the rest and hygiene as for tuberculosis; for late cases, surgical interference when positive symptoms of thyrotoxicosis are unquestionably present.—*Tuberculosis and Goiter, E. P. Sloan, J. Am. M. Ass., June 18, 1927, lxxviii, 1954.*—(*U. E. Z.*)

Interesting Cases of Diseases of Respiratory Organs.—A series of interesting cases involving the respiratory organs is reported, including relaxation of the diaphragm from paralysis of the left phrenic nerve, shot-wound of chest with possible large opening of diaphragm, interesting cavity cases, exceptional pneumothorax cases, healed miliary tuberculosis, and healed embolic lung abscess.—*Einige interessante Befunde an den Atmungsorganen, G. Liebermeister, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 336.*—(*H. J. C.*)

Pulmonary Function in Pneumonia.—The nasal catheter used in conjunction with a calibrated reducing gauge is a valuable and convenient method of administering air containing from 30 to 50 per cent of oxygen when pulmonary function is seriously impaired in pneumonia. A group of cases is reported in which the abrupt withdrawal of oxygen therapy was followed by cyanosis, increased dyspnoea, and rising pulse and respiration. Such therapy is necessary until sufficient resolution has taken place for the arterial blood to be saturated above 90 per cent with room air, and the withdrawal of oxygen therapy should be by a gradual decrease of 10 per cent every twenty-four hours, with close observation for signs of oxygen want.—*Acute Disturbance of Lung Function in Pneumonia: Methods of Oxygen Treatment, A. L. Barach, J. Am. M. Ass., November 26, 1927, lxxxix, 1865.*—(*G. L. L.*)

Compression of Pulmonary Artery by Aneurysm.—A woman, 33 years of age, suffered for about six months from stenocardiac attacks, dyspnoea, and oedema in the lower limbs. Physical examination revealed a marked hypertrophy of both ventricles, moderate cyanosis, and oedema over the sacral region. Over the aorta was heard a systolic murmur. There were basal bronchitis and congestion of liver and spleen. The condition improved after the administration of cardiac stimulants and specific syphilitic treatment. Four weeks later the patient developed a pulmonary infection. A syphilitic aortitis and endarteritis of the coronary arteries could not fully explain the severe dyspnoea and cyanosis, which grew increasingly worse. A syphilitic sclerosis of the pulmonary artery was suspected. The autopsy showed an aortic aneurysm directly above the semilunar valves which compressed partly the pulmonary artery. The intima of the latter showed extensive atheromatous changes, which extended down to the first division of the artery.—*Zur Klinik und Diagnostik der Pulmonalarterienerkrankungen, H. Schlesinger, Wien. klin. Wchnschr., September 22, 1927, xl, 1194.*—(*M. P.*)

Infarct of Lung.—In a patient with extreme emaciation, haematemesis, cough and fever, a clinical diagnosis of pulmonary tuberculosis was made. The roentgenograph showed infarct of the middle lobe, surrounded by well established pleurisy in annular formation. At autopsy, islands of consolidation, typical of a bronchopneumonic process were found, in both lungs. The middle lobe was almost entirely consolidated. Overlying it there was a markedly thickened visceral pleura, which at places was adherent to the costal cartilage. This case is reported to show that not all pleurisies in annular formation are of tuberculous origin, and also as a means of denying the theory that all annular shadows represent pulmonary excavation.—*Hemorrhagic Infarct of the Lung, P. R. Casellas, Am. J. Roentgenol. & Rad. Therapy, May, 1927, vii, 554.*—(*W. I. W.*)

Recurrent Pulmonary Congestion.—A woman had been afflicted since childhood

with multiple extrapulmonary tuberculous foci, such as osteoarthritis of one toe, pleuroperitonitis, and tuberculosis of the uterus and appendages. Twice at three-year intervals she developed a congestion of the upper portion of her right lung, lasting two months and one week, respectively. During these febrile attacks she had abundant mucoid expectoration and the classical signs of consolidation. These exacerbations were independent of a coexisting well-compensated mitral involvement. The pulmonary process was diagnosed as tuberculous despite the absence of tubercle bacilli in the sputum, because the right apex showed slight permanent involvement, and the hilum and cervical lymph nodes became enlarged, and particularly on account of the definitely established tuberculous nature of her extrapulmonary lesions.—*Congestion pulmonaire àpicale à répétition. Nature tuberculeuse probable en raison de multiples manifestations bacillaires extra-pulmonaires, G. Caussade and A. Tardieu, Meeting Soc. d. Hôp., May 6, 1927, reported in Prog. Méd., May 21, 1927, no. 21, 817.*—(*M. P.*)

Haemolytic Streptococci in Pulmonary Tuberculosis.—The presence of haemolytic streptococci as secondary invaders in pulmonary tuberculosis was studied, with a view to determining if these microörganisms bore any direct relationship to the incidence of haemoptysis and hectic fever. Sputum was secured from 119 patients, and haemolytic streptococci were isolated from 22 of these. From 89 of the others streptococcus pseudohemolyticus was isolated. The clinical study of these cases revealed that (1) haemoptysis occurred three times as often among those infected with streptococcus haemolyticus as among the others, (2) hectic fever occurred twice as often, (3) both haemoptysis and hectic fever were present in five times as many cases with haemolytic streptococci as in those without; (4) 52 per cent of the cases without streptococcus haemolyticus had neither haemoptysis nor hectic fever, and only 18 per cent of those with streptococcus haemolyticus were free from haemoptysis and hectic fever; (5) the death-rate up to August 12, 1926, was twice as great among those with streptococcus haemolyticus. It is shown, therefore, that the presence of streptococcus haemolyticus prejudices the prognosis. A study of the theraputic effect of vaccines prepared from streptococcus haemolyticus and streptococcus pseudohaemolyticus is appended. Only 13 patients were treated, and no positive conclusions as to benefit were arrived at. Further studies are to be made.—*On Hemolytic Streptococci as Secondary Infectors in Pulmonary Tuberculosis: Their Relationship to the Incidence of Hemoptysis and Hectic Fever, W. M. Cumming, Tubercle, April, 1927, viii, 308.*—(*B. H. D.*)

Diaphragmatic Hernia Simulating Pneumothorax.—A case is reported of a male aged 22, in whom there was a tympanitic percussion note, shifting dulness, succussion and coin signs and distant amphoric breathing at the right base, the classical signs of hydropneumothorax, with no history or evidence of tuberculosis or injury. However, the mediastinal organs were not even slighty displaced to the left, and there was a perfect excursion of the diaphragm, both unusual signs in spontaneous pneumothorax. A barium meal established the diagnosis of nonrotation of the stomach, or "incomplete embryonic diaphragmatic hernia."—*Nonrotation of the Stomach Simulating Spontaneous Hydropneumothorax, L. H. Harris and B. P. Stivelman, J. Am. M. Ass., November 26, 1927, lxxxix, 1836.*—(*G. L. L.*)

Nontuberculous Spontaneous Pneumothorax in Father and Son.—The condition is not uncommonly associated with pulmonary disease or accident. However, the occurrence of 3 cases in two members of the same family, not associated with a demonstrable disease, is noteworthy. Even though no disease was demonstrable, its supposed absence may be questioned. The common etiological factors of spontaneous pneumothorax are tuberculosis, emphysema, gangrene, abscess, haemorrhagic infarct and carcinoma of the stomach. The cases reported were of father and son. *Case 1:* Male in good health, age 28. Family history negative for tuberculosis. However, the patient had had otitis media in both ears, "double pneumonia" with pleurisy and a second attack of "pneumonia" before five years of age. He had always been athletic and strong. As he vaulted over a fence, resting his weight on the right hand and arm, he was seized with sudden pain in right side of the chest and dyspnoea. Physical examination was negative except for signs of pneumothorax on the right side. The X-ray findings were the same. After two months the physical and X-ray findings indicated that the lung had completely expanded, with considerable peribronchial thickening, but without evidence of tuberculosis in either lung. The highest temperature was 99.5°. The pulse remained normal. The patient apparently made a good recovery. *Case 2:* Was the father of the first patient, an adult male, age 60. Past history negative for pulmonary disease. He was always athletic and apparently healthy, except that

at the age of 37, while playing basket-ball, he was suddenly seized with pain in the left side and dyspnoea. Physical examination revealed collapse of the left lung. He apparently made a complete recovery and continued well until the age of 60. Following a day's work, which involved digging, he complained of pain in the right chest and shortness of breath. There was no history of sudden onset. The physical examination outside of the chest was negative. Signs of pneumothorax, found over the right side, were confirmed by X-ray. No direct evidence of tuberculosis was made out. Recovery was uneventful. It is singular and rare that two adults of the same family, and apparently in good health and without demonstrable evidence of disease of the lungs, should have had spontaneous pneumothorax, the father on the left side at the age of 37, and on the right at the age of 60, and the son on the right side at the age of 28.—*Spontaneous Pneumothorax A. W. Atwood, Boston M. & S. J., December 30, 1926, cxcv, 1237.—(H. M. R.)*

Perthes' Disease.—Perthes' disease comprises a group of nontuberculous or noninflammatory conditions in the upper end of the femur which occur before union of the proximal epiphysis. These must always be differentiated from tuberculosis of the hip. The etiology is unknown, although nutritional disturbances, deficiency of calcium or embryonic malformation have been proposed to explain the condition. Symptoms are not strikingly like those in tuberculosis. They usually occur in children that are underweight but active, and appear as tenderness in the hip and a limp. These clear, only to recur a few weeks later in more severe form. Fever and swelling are absent and pain is not marked. The plate reveals flattening of the head of the femur, separation of the epiphysis and upward displacement of the neck, without destruction of bone. The acetabulum shows no sign of disease. The absence of fever, swelling and pain should point away from tuberculosis as the diagnosis, but it is undoubtedly such cases that account for many reported cases of rapid cures of tuberculosis. A more descriptive name for the disease is offered as"osteochondrodystrophy-juvenalis."—*The Condition Called Perthes' Disease, E. G. C. Williams, Radiology, October, 1926, vii, 337.—(H. S. W.)*

Nonspecific Ulcers of Bladder Following Tuberculosis.—Two cases of renal and bladder tuberculosis are reported, in both of which nephrectomy was done. The capacity of the bladder remained very small in both patients. Six years following the operation ulcerations in the bladder were seen through the cystoscope. The ulcerated parts were removed. Careful histological studies by Prof. C. Sternberg did not reveal any specific tuberculous changes; the histologico-pathological diagnosis was *ulcus inconstatum* in one case and *ulcus simplex* in the other. The therapeutic result was satisfactory in both cases.—*Entwicklung unspezifischer Blasengeschwüre auf dem Boden ausgeheilter Blasentuberkulose, P. Knapp, Wien. Klin. Wchnschr., September 30, 1926, xxxix, 1154.—(M. P.)*

Parturition in Tuberculous Women.—This study is based on 75 cases. The progress of labor in these women suffering from pulmonary tuberculosis was fraught with no more obstacles than in normal parturients. Fifty per cent were delivered at term, 41 per cent had premature labors, and in 9 per cent abortion occurred. Twenty-four per cent came directly from their homes, while the majority of the remaining group came from sanatoria. Only one-fifth of the sanatorium patients were in fair general condition at the time of delivery, while two-thirds of those from their homes were in good general health. This is due to the fact that usually only patients with advanced disease seek hospital care. Fifty-eight per cent of the women from home and 48 per cent of the sanatorium patients were delivered at full term; premature labor occurred in 30 per cent of the former and 45 per cent of the latter. Abortion occurred about with equal frequency in both groups. Lack of resistance, due to advanced pulmonary disease, undoubtedly influences the duration of pregnancy. The onset of a precocious labor is directly proportionate to the gravity of the specific lesion. Tuberculous primiparae are better able to reach full-term delivery than are multiparae. The women, in whom the symptoms of tuberculosis become apparent for the first time during pregnancy, run a very acute febrile course, and develop early laryngeal and intestinal complications. The infant born of a tuberculous mother is usually inferior in development. The cause of this maldevelopment is to a large degree due to tuberculous intoxication and in a small measure to a hypoplasia of the maternal uterus (Merletti). Labor exerts a very harmful influence on tuberculous woman, and this danger is greater in the puerperium. Among the women coming to labor with fever, the pyrexia continued during the postpartum period and, in some cases, was a degree or two higher. Aggravation of the pulmonary lesion was the rule. Laryngeal

tuberculosis grew worse without exception. The mortality among tuberculous women in the puerperium was 50 per cent. Sixty-nine per cent of the women, manifesting tuberculosis for the first time during pregnancy, died during the puerperal period. The mortality among primiparae with preëxisting tuberculosis was 20 per cent; among multiparae it was 48.5 per cent. Pneumothorax therapy was instituted in four cases. These patients came to term and suffered no ill effects.—*Il parto delle tubercolose, G. Russi, Tubercolosi, November, 1926, xviii, 373.—(U. E. Z.)*

Asthma.—In 1,000 patients suffering from asthma the average duration of the disease was fourteen years. Fifty-two per cent of 539 males and 461 females gave a history of asthma or hay fever in their nearest relative. Asthma commences far more commonly in babyhood and early childhood than at any other time, and the great majority of such cases belong to the hypersensitive type. The incidence falls steadily with increasing years, except for a small rise between the years of 25 and 30. At this age lack of exercise and frequent colds may cause an incipient asthma to become manifest. Having discovered proteins to which the patient is sensitive, three methods of treatment are available. They are avoidance of the protein, specific desensitization, and the nonspecific method of desensitization.—*A Review of 1,000 Cases of Asthma, F. Coke, Brit. M. J., May 28, 1927, no. 3464, 955.—(W. I. W.)*

Asthma and Tuberculosis.—In studying a group of asthmatics, about 80 per cent showed some form of allergy, but the causative agent of their attacks was unknown. In endeavoring to find the cause of attacks in these 80 per cent the environment of the asthmatic patient was of primary importance. The character of the soil is also of great importance, sandy soil and a low-level ground-water offer much better conditions for asthmatics than clay and peat soil and a high-level ground-water. On the basis of such observations the hypothesis was formulated that the difference between various climates is due to certain allergens in the air, the presence of which is dependent on factors of climate; they may be called climatic allergens. They must be considered as the principal causes of asthma in all flat countries with a high humidity and a moist soil. The clinic for allergic diseases is established in two private houses rather badly built, damp, and situated on clay soil in a humid region near a canal. In several rooms of these houses small chambers have been built of *Eternit*, a kind of asbestos and a materia on which bacteria or moulds cannot grow. Mattresses, pillows and other bedding are regularly sterilized every month, so that the possibility of microörganisms growing in them and producing allergens is extremely small. The patient remains in this chamber during the whole night. During the first few days of their residence in the clinic the patients often stay in the chamber during the daytime also. No material is taken into the chamber which may contain allergens. All the chambers in the clinic are ventilated by a large exhaust, which draws air from the top of an iron tube fixed alongside an iron tower 100 feet high. Five hundred patients have been treated in this clinic. About 75 per cent were completely, or almost completely cured within some days, about 15 per cent improved materially within some weeks, and 10 per cent remained unaltered. Sixteen patients suffering from severe tuberculosis were treated in these allergic-proof chambers. It was observed that the allergen-free air gives about the same results in the treatment of tuberculosis of the lungs as high altitudes. In tuberculosis patients who are treated in these allergic-proof chambers definite improvement occurs within a few days, and this is precisely what was expected, and is analogous with the improvement in climate asthma.—*Asthma and Tuberculosis in Relation to "Climate Allergens," W. S. Van Leuwen, Brit. Med. J., August 27, 1927, no. 3477, 344.—(W. I. W.)*

Bronchial Asthma.—Bronchial asthma may be due to many different causes, and an exhaustive history is of fundamental importance in the specific diagnosis of the disease. The age of onset of the asthma is of more importance than the age of the patient. The earlier in life the asthma starts, the more likely it is to be due to sensitization. Asthma starting after the age of 40 is usually due to bacteria. It is quite important to ascertain the occupation of the patient, as herein may lie the entire cause of his asthma. It is important also to determine the occupation of other members of the household with whom the patient comes in contact. For example, a veterinarian or a laboratory man working with animals may bring home on his clothing and hair sufficient of the animal's epidermal emanation to cause asthma in a highly sensitive individual. Sensitization to foreign substances is inherited in about 50 per cent of cases, hence the importance of the family history. The past history may have definite value; for example, eczema in infancy or childhood followed by asthma is very suggestive of food sensitization. Perennial or nonseasonal asthma may

be due to sensitization to foods, animal epidermals, bacteria or miscellaneous inhalants, such as orris root or pyrethrum. It may also be due to pollen sensitization, but as a rule these cases are worse during the pollen season. Seasonal asthma, on the other hand, is generally due to pollen sensitization. Climate is an unimportant factor except in bacterial asthma. The spectacular relief obtained by some asthmatic patients on going to another locality is found in cases due to sensitization to some substance in the patient's home environment. It is bad policy to test every patient with every allergic substance on hand. The tests to be made and the tests to be avoided should be decided entirely by the history of the individual case. In getting a history of food sensitization ascertain whether the patient has ever eaten anything at any time in his life that seemed to aggravate his asthma, or disagree with him in any way. It is only the protein in the food that can cause sensitization. The staple articles of diet are encountered in innumerable ways. For example, a patient may state that he never eats eggs, but he is undoubtedly getting egg in other food. Egg is used in cakes, custards, puddings, pastries, most baking powders and the like. For sensitization to animal epidermals inquire as to what animals are about the home or place of occupation. Ask if contact with animals causes any symptoms of irritation of the eyes or nose or aggravation of the asthma. In addition to actual contact with animals, careful inquiry should be made as to which of the animal epidermals, such as features, hair or wool, are present in the patient's environment. There are certain points in the history which aid in differentiating nonsensitive asthma or asthmatic bronchitis from the true sensitive or allergic asthma. When there is itching of the eyes the case is not likely to be a bacterial one. The nasal secretion in bacterial cases is likely to be thick, sticky, and frequently yellowish, in contrast to the thin, clear, watery secretion of the sensitive cases, although there may be a thin, watery secretion with a streptococcus infection. Inquiry should be made of every patient with asthma as to whether trees, plants, flowers or weeds, such as grass, hay, roses, goldenrod or ragweed seem to bother him in any way, especially if the attacks are limited to or worse during the pollen seasons, spring, summer or fall. Under miscellaneous inhalents as a cause of asthma, orris root easily takes first place, because of its extensive use in face, talcum and tooth powders, sachets and dry shampoos. *Conclusion:* The value of a history in bronchial asthma is dependent upon the care and patience with which it is taken, the physician's knowledge and appreciation of the significance of the various factors involved, which is acquired largely by experience, and the intelligence and coöperation of the patient.—*History Taking in Bronchial Asthma, G. T. Brown, J. Am. M. Ass., May 28, 1927, lxxxviii, 1693.*—(*B. T. McM.*)

Bronchial Asthma.—Reports of the benefit derived from the various methods of treatment of bronchial asthma are extremely diverse. Thus far, no method of treatment seems to have greatly influenced the course of the disease, which is variable by nature. In its etiology, anaphylaxis may be dismissed from consideration. Protein sensitization is indeed a phenomenon in this disease, but it apparently is not the basic cause of the condition. It is true that the sensitization tests indicate intoxication by some substance or substances, usually protein in nature; but treatment for purposes of desensitization or immunization is futile in the endeavor to obtain an absolute cure. The relation of nasal disease to asthma shows evidence of a constitutional susceptibility rather than a causal relationship, just as do vagotonia, haemoclasic crises, and all the other theories thus far advanced in the causation of asthma. The final solution in discovering the genesis of bronchial asthma lies in the phenomena of heredity. The condition is rooted in the biological and physicochemical structure of the chromosomes. An hereditary factor is present, not in a certain fraction of the cases, but in 100 per cent of the cases. The fallacies of statistics on heredity in human beings are well established and depend mainly on the insufficient knowledge of ancestry in cases of bronchial asthma. *Conclusions:* An absolute cure of asthma is, therefore, not to be expected until a method has been found which will alter the chromosomal constitution either in the adult or, more radically, in the genetic cells.—*Present Status of Curability of bronchial Asthma, with Replies to a Questionnaire, M. H. Kahn, Arch Int. Med., May 15, 1927, xxxix, 621.*—(*W. I. W.*)

Etiology of Bronchial Asthma. A study was made of a series of cases limited strictly to essential bronchial asthma. It was noted that all had chronic infections of the bronchi or sinuses and that the severity of the asthmatic symptoms paralleled the seasonal virulence of these infections. Investigations were based on the theory that long-retained secretion may become partly reabsorbed through the damaged mucosa, and the patient thus becomes sensitized to his own exuded proteins. Berkefeld filtrates were made of these secretions, and an attempt to sensitize guinea pigs with them re-

vealed that five out of six animals showed only moderate temporary respiratory difficulty. Soluble toxins were made from the secretions, and only one of six guinea pigs showed transitory bronchial spasm following injection of the toxic dose. Bacterins were also prepared from the secretions and the three preparations were used to test the patients intracutaneously. Seventy-seven per cent of these patients gave positive allergic reactions with filtrates of their own bronchial or sinus secretions. Twenty-eight out of fifty-six who reacted allergically were relieved when treated with these filtrates, an injection being made every fourth day, alternating with injections of soluble toxins and bacterins. Treatment was started with the amount of material which, when given intracutaneously produced a hyperaemic area not larger than 2 cm. in diameter. It was found that about 50 per cent of patients have become sensitized to their own bronchial secretion proteins.—*Studies in the Etiology of Bronchial Asthma, J. Eiman, J. Am. M. Ass., September 17, 1927, lxxxix, 953.—(G. L. L.)*

House-Dust in Asthma and Hay Fever.—Patients frequently give the history of coughing or sneezing, or of hay fever or asthma when in an atmosphere filled with house-dust. Sensitization to dust is so marked in many patients that they have symptoms from the small amount that is at all times suspended in the air of the ordinary home. Certain individuals who develop asthma a few hours after retiring are probably sensitive, not only to feathers or other emanation proteins but also to the dust of their bedroom, which gradually accumulates on the mucous membrane until enough absorption occurs to cause symptoms. Such an explanation may be the real basis of the sneezing and coughing on arising from sleep. Dust-sensitive patients are worse in the winter when they are confined more closely to their homes. House-dust arises chiefly from materials of animal epidermal origin which are used in house furnishings. Feather pillows, hair mattresses, woolen blankets and carpets give rise to a surprising amount of dust. It may also contain rabbit and goat hair from upholstery, orris root from face powder, pyrethrum, glue, wood and matting dusts. This type of sensitization can often be controlled by a thorough cleaning of the living room, and especially the bedroom of the patient. Furnishings made from animal hair and wool should be eliminated. Such a procedure is usually effective if other sensitizations, such as food or pollen, are adequately controlled. *Conclusions: 1:* Forty-two per cent of a series of 162 patients with asthma gave reactions to house-dust extracts, and 20 patients with perennial hay fever also gave such reactions. *2:* Dust reactions have been obtained in all age-groups with the scratch test. *3:* A large number of patients have a characteristic history of dust sensitization. *4:* It is necessary to test with a large number of stock and autogenous dust-extracts. *5:* Dust reactions may depend on one substance or on a summation of lesser reactions to several substances, such as animal emanations, orris root, pollens and various fabric-dusts, and the possibility of an unknown specific substance in house-dust is unlikely. *6:* Reactions to dust rarely occur without one or more other reactions to proteins commonly used in testing. *7:* Desensitization to house-dust extracts, which give definite reactions in the patient, is probably advisable in cases in which a marked history of dust sensitization is present.—*House Dust in the Etiology of Bronchial Asthma and of Hay Fever, A. H. Rowe, Arch. Int. Med., April 15, 1927, xxxix, 498.—(U. E. Z.)*

Nose and Throat in Bronchial Asthma.—The nose, throat and ears of a large series of patients were carefully examined, and abnormal conditions remedied, with special interest in two classes of patients: (1) the infectious cases, that is, those that react not at all or only feebly to skin tests, but that have a definite focus of infection; and (2) those that react to specific substances but are not benefited by treatment, and that frequently have pathological conditions of the nose in addition to this hypersensitiveness. Transillumination revealed one or more dark sinuses in 30 per cent of the series, and 77 per cent of these infectious cases were followed up. In 15 per cent there was no improvement, in 22 per cent slight, in 42 per cent moderate, and in 22 per cent marked improvement, the treatment consisting of washing out the antra, the use of suction in obscure sphenoidal sinusitis, nasal packs of colloidol silver preparations, resection of turbinates, and occasionally radical operations. Sphenoidal sinusitis is much more common than is generally supposed. Nasal polypi were present in 24 per cent of the patients, frequently associated with sinus disease. Removal produced no improvement in 15 per cent, slight in 31 per cent, moderate in 43 per cent, and marked improvement in 11 per cent. Polypoid degeneration of the nasal and antral mucous membrane is fairly common, and in some cases the area should be removed, not so widely, however, as to cause ozaena later on. Submucous resections are frequently called for, and turbinates pressing on the septum should be treated with the

cautery. Removal of diseased tonsils has not produced any marked beneficial results. About 60 per cent of the series had diseased tonsils, and a follow-up history of 35 per cent who had the tonsils removed as compared with those who had no treatment, showed very little difference in the results. In all patients with asthma the teeth should be carefully studied and infections cleared up.—*Nose and Throat Observations in Examination of Patients with Bronchial Asthma, P. S. Stout, J. Am. M. Ass., September 10, 1927, lxxxix, 868.—(G. L. L.)*

Asthma and Nasal Conditions.—The asthmatic nose is the nose of frequent and prolonged colds, handicapped by the results of chronic infection or various anatomical malformations. The intranasal condition varies greatly with the seasons of the year. In children with acute asthmatic bronchitis there is nearly always a large obstructing adenoid. The presence of basal polypi or hyperplastic ethmoiditis is an indication for intranasal surgery. It is probable that in all cases of asthma there is an underlying basic condition originating in focal infection. Surgery that restores the intranasal structures toward normal, with the least possible removal of mucosa, in most instances quickly relieves the frequent colds, although this is more to be expected in the young asthmatic than in long-standing asthma in elderly patients. Anterior ethmoiditis is usually found early in the cold; later the antra of Highmore may become involved. In children the sphenoids and posterior ethmoid cells are also often infected, because of the presence of infected adenoid tissue. Too much reliance must not be placed on an apparently negative roentgenograph of the nasal sinuses.—*Asthma from the Standpoint of the Rhinologist, E. McGinnis, J. Am. M. Ass., September 17, 1927, lxxxix, 959.—(G. L. L.)*

Allergy and Bronchial Asthma.—It was not possible to obtain an expression of the allergic reaction in all of the 40 cases of bronchial asthma. It is pointed out that with various meats and protein substances only the intermediary products act allergically. An effort to elucidate the allergy by complement fixation resulted negatively. Allergy to the individual substance was not inherited nor was the allergy of a definite organ, but the general hypersensitive condition may be. The various therapies are discussed, including nonspecific peptone administration, tuberculin injections and roentgen-raying.—*Die Beziehungen der Allergie zum Asthma bronchiale, I. W. Samson, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 920.—(H. J. C.)*

Bronchoscopy in Asthma.—Bronchoscopic investigation should be considered only in those cases which do not present evident etiological factors, or in which there is no favorable response to the prescribed treatment. Bronchoscopy has revealed that in many patients treated as asthmatics some other condition has been the cause of the symptoms, such as stenosis of the larynx of inflammatory origin or as the result of new growths, or organic stenosis of the trachea or bronchi. The diagnosis of asthma should never be made in a child without excluding the possibility of a foreign body. During the investigation of a large number of patients the chances noted were those of a chronic tracheobronchitis, the mucosa being either intensely inflamed, velvety or granular. In cases examined during paroxysms there was marked swelling of the mucosa, which was cyanotic and purple, in one case the marked oedema obscuring the ring markings. In nearly every case there was an increase in the amount of secretion, varying from mucoid to purulent, the latter usually being traced to lower-lobe bronchial branches, while the mucoid secretion was at times very thick and mucilaginous, occluding the smaller bronchioles. In certain cases a collapse of the posterior tracheal wall forward was noted during expiration and cough, resulting in a crescentic lumen. In other cases the lateral walls also collapsed, giving a triangular lumen, while in three cases there was an associated collapse of the bronchial walls. With thick secretion adherent to the walls, the mechanical explanation of wheezing expiration in these cases was obvious. There was no evidence of spasm of the trachea and bronchi found in the cases examined, nor were any mucosal erosions discovered. Bronchoscopic treatment is most successful in patients who have a chronic tracheobronchitis with increased secretion, and consists of removal of the secretion and the application of suitable medication. There is usually considerable relief after bronchoscopy alone, which may continue for weeks or months. Vaccine made from secretions removed bronchoscopically will often give relief when a stock or autogenous vaccine made from sputum has failed.—*Bronchoscopy as Aid in Diagnosis and Treatment of Bronchial Asthma. L. H. Clerf, J. Am. M. Ass., September 10, 1927, lxxxix, 872.—(G. L. L.)*

X-Ray Diagnosis of Asthma.—A diagnosis of asthma is not complete without an X-ray of the chest and sinuses, and a careful search for foci of infection in the upper air passages. Bronchoscopy in a series of asthma patients has revealed the presence of a thick tenacious exudate in the majority of the cases. Bronchiectasis is not an un-

common stage of development. The X-ray usually reveals a general peribronchial thickening, the bronchi having an angular appearance rather than the taut, straightened appearance seen in healed peribronchial tuberculosis. Chronic infection in the lower lobes is shown by marked increased thickening of the bronchi, partial obliteration of the normal bronchial markings, evidence of exudate, and, at times, numerous small cavities. Diaphragmatic adhesions are often present. Thickened root structures are so variable even in normal persons, that these cases are difficult to classify, although two cases are noted in which tuberculous lymph-node enlargement produced expiratory obstruction of the bronchus and trachea. A recent investigation of 193 consecutive cases in Jackson's clinic, of foreign bodies in the air-passages, revealed that not infrequently the foreign body was overlooked for years, during which time the patient was treated for asthma. Infection of the upper air-passages is a frequent complication and an important factor in the etiology of asthma.—*Roentgen-Ray Observations in Asthma, W. F. Manges and S. J. Hawley, J. Am. M. Ass., September 10, 1927, lxxxix, 870.*—(*G. L. L.*)

Skin Tests in Asthma.—In 1,281 patients suffering from bronchial asthma, 23,725 routine skin tests were made over a period of six years, from 0.01 to 0.02 cc. of extracts prepared after the method of Coca being injected intracutaneously, and the results read in fifteen minutes. There was a positive reaction in 11.3 per cent of the tests. In 188 completely tested patients there was only one positive reaction and 120 of these gave a reaction to house-dust alone. Ragweed pollen gave a positive reaction in 20 per cent of patients tested, this including seasonal asthmas but not hay fever cases showing no asthma. Goat hair elicited 18 per cent positive reactions and wool 12 per cent, but neither are of much clinical importance. There were 11 per cent of reactions to orris root, however, which is diagnostically important, and is found in nearly all face powders. Chicken, duck and goose feathers gave from 14 to 19 per cent of positive reactions. In the group of animal danders, which are important in that remarkably good results can be obtained in patients sensitive to them, cat dander gave 8.4 per cent positive tests, the horse, dog and rabbit varying between this and 2.5 per cent. Horse serum caused positive reactions in 2.6 per cent. Other figures were grass pollen 5.6 per cent; rice polish 10 per cent (highest among the cereals, but in no instance being established as a cause of asthma); buckwheat 3.4 per cent (in nearly every instance being an important factor); wheat 8.8 per cent; tobacco 8 per cent; flaxseed 5 per cent; cottonseed 2.9 per cent (nearly always being a causative factor, and for this reason very dilute extracts being used in testing). In the 188 completely tested patients giving a single positive reaction, those substances predominated which were tested in strongest possible concentration, namely, house dust, feathers, pepper, tobacco, goat and wheat. It is possible that a good many of these reactions are due to the high nitrogen content of some solutions, producing a peptone or histamine reaction in the skin. A number of patients were given routine tests with various foods, a large percentage giving positive reactions to foods of no significance in the causation of asthma. The most important food causing asthma is egg.—*Skin Tests in Patients with Asthma, J. S. McLaughlin, J. Am. M. Ass., September 10, 1927, lxxxix, 863.*—(*G. L. L.*)

Treatment of Asthma.—Organic disease which might cause asthmatic symptoms should be ruled out first, and then a complete cutaneous test with proteins and pollens is necessary. If found positive and elimination of the protein does not relieve the patient, specific desensitization is carried out. Failing this, stock and autogenous vaccines are used. Many patients develop a sensitiveness to their own respiratory-tract or sinus secretions, and marked relief may be secured by the use of filtrates, soluble toxins or bacterins prepared from these secretions, graduating the dosage upward from an initial dose of the amount of material that does not give an area of hyperaemia greater than 2 cm. in diameter. Mild reactions may be ignored. Quartz-lamp treatment has been found of definite value in patients with a calcium deficiency. Relief in acute attacks of asthma is definite from exposure to infrared rays followed at once by ultraviolet radiation. By this method 31 of 50 cases were cured, and 17 relieved. Roentgen-ray treatment is of benefit in bronchial asthma, but its action has not yet been determined. Some cases of asthma associated with endocrine dyscrasia have responded fairly well to epinephrin combined with postpituitary substance and thyroid extract. Epinephrin in 5 to 15 minim doses is the most efficient drug in controlling the attacks. Ephedrine is an allied drug, but its effects are more persistent; it is more stable, and as efficient when given by mouth as when injected intramuscularly. It should be administered with care, the maximum daily dose being 4.5 grains. Operations on the nose and throat are inadvisable in patients who have not been thoroughly investigated from an allergic

standpoint. Climatic change or hospitalization should be used as a last resort. About 70 per cent of all patients can be more or less relieved if a thorough study of the case is made and the use of specific proteins and vaccines is adhered to.—*Studies in the Treatment of Bronchial Asthma, H. B. Wilmer, J. Am. M. Ass., September 17, 1927, lxxxix, 956.*—(*G. L. L.*)

Treatment of Asthma.—A report is made of the results of treatment in 882 cases of bronchial asthma, including those cases of paroxysmal dyspnoea seen in emphysema and chronic bronchitis. Four measures were utilized: (1) specific treatment, consisting of elimination from the patient's environment of those substances giving a positive skin reaction, as well as a process of hyposensitization; (2) the surgical treatment of infections of the accessory nasal sinuses, and of deformities predisposing to infection; (3) vaccine therapy, used in those cases in which there was neither skin reaction nor infection; and (4) drug therapy, consisting mainly in the use of iodides by mouth, stramonium and epinephrin. Satisfactory results were secured in 70 per cent of the total number, the symptoms being completely or almost completely relieved in 22.6 per cent. The best results were obtained in ages between five and fifteen, results being less good with increasing age, and the duration of the disease being apparently of little importance. Slightly better results were obtained in women than in men, although the menstrual function is recognized as an aggravating factor. The results of treatment were especially good in those patients who showed positive skin reactions, 71 per cent of the marked cases being improved as compared with 45 per cent of negative reactors. A complicating infection lowers the percentage of good results to slightly over 50, but, while these cases do not do as well as those with skin reactions alone, they offer a better prognosis than those that reveal neither infection nor hypersensitiveness. Peribronchial thickening and enlarged root shadows have little effect on prognosis, but results are decidedly poorer when there is roentgenographic evidence of lower-lobe infection.—*Factors Governing the Treatment of Asthma, J. A. Clark, Jr., J. Am. M. Ass., September 10,* 1927, *lxxxix, 866.*—(*G. L. L.*)

"Ephedrine" in Asthma and Hay Fever.—Ephedrine sulphate was used in the treatment of 110 cases of asthma, the dosage in adults being usually 50 mgm., and in children 25 mgm., by mouth. Administration was most effective before the expected attack or during the prodromal period, and better results were obtained when the stomach was empty. In an attempt to classify the results the conclusion was reached that the limiting factor of the effectiveness of ephedrine was the severity of the individual attacks and not some inherent quality of the patient, not infrequently the same patient obtaining relief from a mild attack, but no relief whatever during a severe paroxysm. No difference was noticed in the effectiveness of the drug in children and adults, but it was noticed, however, that each succeeding dose became less effective. Only one of five hay-fever patients given ephedrine by mouth experienced relief, but topical applications of a 3 per cent solution in the nose proved of considerable value in 18 of 20 patients so treated, the relief lasting from twelve to twenty-four hours, without any of the irritation sometimes experienced in the use of epinephrin.—*Ephedrine in Asthma and Hay Fever: Value of Ephedrine as Shown by Its Use in One Hundred and Ten Cases of Asthma and Twenty Cases of Hay Fever, G. Pines and H. Miller, J. Am. M. Ass., August 13, 1927, lxxxix, 515.*—(*G. L. L.*)

Treatment of Hay Fever with "Ephedrin."—*Ephedrin* given by mouth in 25 mgm. to 60 mgm. doses afforded temporary relief to slightly more than 50 per cent of patients with autumnal hay fever. An additional 25 per cent obtained sufficient relief to consider its use warranted. *Ephedrin* given in a 3 per cent solution as a nasal spray is less efficacious, and the relief is of shorter duration. However, the majority of patients felt that it added to their comfort. The best results were obtained when the spray was used early in the paroxysm. The effect of both the local and internal administration seemed to depend on the severity of the paroxysms, and the good results were obtained in the milder seizures. Eleven patients who obtained only partial relief from preseasonal treatment were able to control their symptoms with the occasional use of *Ephedrin*. A neurotic temperament and the nervous state of the patient are important factors in the production of tremor, rapid heart action, and other distressing symptoms produced by the drug. While the value of *Ephedrin* is limited and its effect temporary, observation of 55 patients during two seasons warrants the conclusion that the drug should be given a definite place in the symptomatic treatment of autumnal hay fever. It is emphasized that when good effects are obtained, they are temporary and symptomatic.—*Further Observations on the Treatment of Hay Fever with Ephedrin, F. W. Gaarde and C. K. Maytum, Am. J.*

Med. Sc., November, 1927, clxxiv, 635.—(W. I. W.)

Etiology of Bronchial Dilatation.—In many cases of relapsing pulmonary gangrene and prolonged pulmonary suppuration a clinical syndrome is observed similar to that occurring in the course of bronchial dilatation. Beginning or well-developed bronchiectases are discovered with lipiodol. The evolution of the process is clearly associated with the acute gangrenous or suppurative lesions. With a negative past history referable to the lungs and in the absence of demonstrable syphilis, the question arises as to whether or not this condition, observed by Laennec in children, could develop in adults. Through the demonstration, pathologically and bronchoscopically, of the simultaneous involvement of the bronchi and parenchyma and the early development of peribronchial sclerosis, the evolution of the process is better understood. This condition is aptly characterized by the American term, *bronchiectatic abscess.—Sur l'étiologie de certains cas de dilatation bronchique de l'adulte, Kindberg and Kourilsky, Meeting, Soc. Méd. Hôp., December 24, 1926, reported in Prog. Méd., January 22, 1927, no. 4, 143.—(U. E. Z.)*

Bronchiectasis.—Iodized oil is invaluable as a contrast medium for roentgenography in suspected bronchiectasis, revealing dilatations hitherto hidden behind the heart or dome of the diaphragm or not visualized in the ordinary roentgenograph, thus making an earlier diagnosis possible. The dangers in the use of lipiodol are negligible, as the oil is bland and nonirritating, and does not remain in the lung for any lengthy period. In a single bronchiectatic cavitation, or in those cases in which localized gangrene indicates perforation of a cavity into the lung, drainage is the treatment of choice. Artificial pneumothorax and phrenicotomy are tentative procedures in early mild cases, especially in children. In cases of secondary inflammatory involvement of the lung adjacent to the dilatations, however, the lung is relatively incompressible by pneumothorax, diaphragmatic adhesions also limiting this procedure. Phrenic exairesis is indicated as a preliminary to thoracoplasty or when pleural adhesions prevent pneumothorax, and along with graded extrapleural thoracoplasty in long-standing cases. A five-stage operation for complete costectomy of all the lower ribs is the safest procedure, the usual result being marked improvement or symptomatic cure, and the operative mortality being relatively low. Of 14 cases reported in 1926, three died from one to two years after operation, three are symptomatic cures, and eight are markedly improved, seven of these eight working. Primary lobectomy and cautery extirpation are not to be recommended, on account of high postoperative mortality and the frequency of bronchial fistula, but secondary lobectomy and graded cautery extirpation following thoracoplasty, when indicated, should prove relatively safe and effective. Sauerbruch has had one death in seven such operations.—*The Diagnosis and Treatment of Bronchiectasis, C. A. Hedblom, J. Am. M. Ass., October 22, 1927, lxxxix, 1384.—(G. L. L.)*

Bronchiectasis.—A critical review of 13 cases of developed bronchiectasis of variable etiology, including syphilis, chest wounds, gas poisoning, bronchial and pulmonary diseases of tuberculous nature, is presented. Medicaments and climactic therapy were without avail.—*Kasuistische Beiträge zur Frage der Bronchiektasien, Steinmeyer and Kathe, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 275.—(H. J. C.)*

Bronchiectasis of Preterminal Bronchial System.—As the result of an examination of a case in which Wood's metal casts were made after previous rinsing with formalin, the Brauer *caverniculae* of the X-ray picture are described as preterminal bronchiectases. They usually are found as part of a disease showing a deforming bronchiolitis of a number of *bronchioli respiratorii.* With extension into the larger bronchi genuine bronchiectases were produced. In the case reported the stenosis of a bronchial branch occasioned asthmatic attacks, and was due to the ingrowth of a lymph node into the bronchial wall, but this was not the cause of the disease itself.—*Bronchiektasen der präterminal Bronchialsysteme. Zugleich ein Beitrag zur Brauerschen Lehre von den Caverniculae, H. Loeschke, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 382.—(H. J. C.)*

Haemoptysis from Bronchiectasis.—Profuse and recurrent haemoptysis continued in a young man after a torpid tuberculosis of the left upper lobe had healed. Injection of lipiodol confirmed the diagnosis of bronchiectasis of the right lower lobe. It is pointed out that the characteristic grape-like appearance of the dilated bronchi is not always found. The left lower bronchus, in the case presented, had a nearly horizontal course, owing to the cicatricial retraction of the left upper lobe.—*Remarques sur un cas de bronchiectasie hémorragie par explorée radiologiquement après injection de lipiodol dans l'arbre bronchique, E. Rist, L. Gally and A. Soulas, Meeting, Soc. méd. d. Hôp., February 4, 1927, reported in Prog. Méd., February 19, 1927, no. 8, 295.—(A.P.)*

Treatment of Chronic Bronchiectasis.—The treatment of chronic suppurative bronchiectasis limited to one lobe of the lung has long fascinated those interested in thoracic surgery. Medical treatment may be briefly dismissed as ineffective, except for palliative and temporary symptomatic efforts, such as can be accomplished by a warm dry climate and postural drainage. Bronchoscopy yields only palliative results, dependent on the mechanical facilitation of drainage. Artificial pneumothorax is also only palliative, although in some cases the results are striking while the lung remains collapsed. The dangers of empyema, however, are most serious. *Surgical Measures:* Extrapleural thoracoplasty is a very safe procedure done in several stages, and must be resorted to when more than one lobe is involved. However, it has produced no cures, but merely improvement. External drainage is not curative, although it is sometimes necessary. The only hope for a permanent cure lies in radical extirpation of the diseased portion of the lung. Graham has had some brilliant successes with cautery lobectomy (mortality about 20 per cent), but the operation is a blind one and there is danger of secondary haemorrhage. Intrapleural amputation carries too high a mortality to be recommended (47 per cent in Lilienthal's hands). Whittemore has devised a new method of procedure that combines partial collapse of the chest-wall with the freeing of one lobe of the lung and fastening it outside the pleural cavity, where it becomes necrotic and within about two weeks sloughs off, leaving a healthy granulating stump that contains discharging fistulae which gradually close. Of 4 patients operated on in this way only one has died, and his general condition was very poor. *Conclusions: 1:* It is possible to perform lobectomy by this (described) method. *2:* The operation is followed by less shock than any other technique. *3:* Two of the 4 cases have been cured and resumed normal occupations. *4:* The operative procedure may be completed in one or two stages, the first being an extrapleural thoracoplasty.—*The Treatment of Chronic Bronchiectasis, W. Whittemore, Boston M. & S. J. February 3, 1927, cxcvi, 182.*—(*A. P.*)

Mediastinal Pleurisy and Bronchiectasis.—There has been very little added to our knowledge of mediastinal pleurisy since the work of Devic and Savy in 1910. The etiology of this affection is apparently still uncertain, if one excepts the frankly suppurative forms. Devic and Savy mention an adhesive form, probably the result of a purulent or serous exudate. This form is distinguished from the form with exudate only by the lesser density of the X-ray shadow, which otherwise is much the same. Usually there is a right-angled triangle, its hypotenuse external and extending toward the midline. The shadow is easily seen when on the right, but more frequently it is on the left and must be differentiated from the cardiac shadow. This is readily accomplished by employing the different oblique positions, which indicate also whether the thickening is in the anterior or posterior mediastinum. But the characteristic shadow is seen rarely. In their wide tuberculosis experience at the Laennec Hospital the authors do not recall ever seeing it associated with definite pumonary tuberc ulosis. On the other hand, they have been surprised to find it associated most frequently with a condition not previously considered as concerned in its etiology, namely bronchiectasis. Lipiodol injection has greatly helped in diagnosing bronchiectasis. A single case followed at length gave a clue. Since then all cases showing the characteristic X-ray shadow of mediastinal pleurisy have been searched for bronchiectasis, and with the aid of lipiodol it has almost always been found. Seven cases are described in some detail, and the X-ray pictures shown. In all of them there was the classical picture of posterior mediastinitis, in the shadow of which the injected lipiodol outlined frank ampullae, bronchiectatic cavities in the domain of the chief bronchus of a lower lobe. In none of the cases was there actually any collection of pus in the mediastinum although the symptoms and the expectoration of foul-smelling pus appeared to strengthen this X-ray diagnosis. Three cases, two of them treated by artificial pneumothorax, demonstrate that the paravertebral triangular shadow should be properly interpreted as the evidence of a mediastinal pleurisy, although not necessarily exudative or purulent: it may be adhesive just as well. The adhesive mediastinal pleurisy, or, to speak exactly, the costomediastinal pleurisy, is therefore an epiphenomenon of certain bronchiectases, and more particularly of those which develop in the area of the principal lower bronchus. Anatomists have rather neglected the study of the location of the bronchi of the second and third order. Lipiodol and the X-ray show that a posterior inferior bronchiectasis, whether right or left, is nearest the mediastinal pleura, and the latter therefore is the portion of the pleura most apt to become involved secondarily. The authors see in certain children, recently reported by Guinon and Levesque, probably the early stages of what may later become a pronounced bronchiectasis. The children had a persistence

of symptoms or physical signs or both after measles or pertussis or bronchopneumonia, and the X-ray showed the paravertebral triangle, although less dense and less uniform. On the other hand, lipiodol did not reveal the bronchiectasis. The adult cases are probably the later result. Finally, it is said that every case showing the triangular shadow suggesting a posterior mediastinitis should be examined by lipiodol injection. If bronchiectasis be found associated with the pleurisy it remains to be decided whether the pleurisy is adhesive or suppurative. A mediastinal empyema emptying itself by vomica must communicate with the bronchi, and consequently should show by X-ray a collection of air and pus: the top of the triangular mediastinal shadow is then truncated by a horizontal fluid-level surmounted by a transparent bubble. The absence of this sign is a strong argument against mediastinal empyema and for bronchiectasis alone as the cause of the purulent expectoration.—*Pleuresie mediastine et bronchiectasie, étude clinique et radiologique, E. Rist, P. Jacob and P. Trocme, Ann. d. Méd., Paris, 1927, xxi, 144.*—(*W. B. S.*)

Chronic Pulmonary Abscess.—*Case Report:* A girl, 14 years of age, developed the typical symptoms and signs of a pulmonary abscess following an epileptic attack, during which her mother tried to force the intake of fluid. The sputum had a very putrid odor, and the X-ray demonstrated a cavity, the size of a cherry, with a fluid level below the right clavicle. Treatment consisted of *Transpulmin* injections (a quinine preparation), and in breathing exercises. After four months' treatment the sputum disappeared, the patient was free of symptoms and in excellent general condition. The X-ray plate showed only a small density at the side of the cavity.—*Zur Frage der Entstehung und Behandlung chronischer Lungeneiterungen, E. Kirsch-Hoffer, Wien. klin. Wchnschr., April 7, 1927, xl, 454.*—(*M. P.*)

Bronchial Occlusion in Nontuberculous Pulmonary Disease.—The usual indications of pulmonary abscess, such as cough, explosive expectoration, foul breath and sputum, dulness over a circumscribed area, and certain significant X-ray findings are mentioned, but bronchial occlusion as part of the process is especially emphasized. A careful history is necessary. The physical findings present in valvular occlusions produced by foreign bodies may be tympany, diminished or absent breathing, whispered voice and tactile fremitus, and displacement of the heart to the opposite side. Findings present with complete bronchial occlusion due to suppurative lesions, tumor or foreign body are those of atelectasis of that portion of the lung supplied by the occluded bronchus. Roentgen-ray evidence may be direct, as in case of metal in a bronchus, or indirect in cases of valve-like closure due to nontransparent objects. In the latter instance the partially obstructed side is more transparent. Comparison of the films taken at the end of inspiration and expiration accentuate the appearance due to acute infection. When bronchostenosis is indicated bronchoscopy is necessary to establish the nature of the obstruction. Methods of treatment emphasized are both medical and surgical. *Medical:* Postural drainage is indicated, and is most satisfactory in acute cases with disease of short duration and small lesions situated above the root of the lung. Bronchoscopic investigation and drainage are indicated in the nonforeign-body and foreign-body cases, though better results are obtained in the latter. It should be used in conjunction with postural drainage, and when so used the percentage of favorable results is doubled. Artificial pneumothorax gives best results in cases with deeply seated abscess, free pleura and open bronchi. Surgery is the method of choice in acute cases following a period of rest, with single circumscribed peripheral lesions preferably walled off by adhesions. Phrenicotomy and thoracoplasty are considered as alleviative rather than curative measures.—*The Diagnosis and Treatment of Acute and Chronic Nontuberculous Pulmonary Suppurative Lesions, E. T. Lord, Boston, M. & S. J., September 1, 1927, cxcvii, 333.*—(*H. McL. R.*)

Pulmonary Gangrene.—Pulmonary gangrene is caused by the fusiform bacillus with Vincent's spirochaete, or with streptococci, or with both. Other microörganisms are frequently superimposed upon the original infection. The most important ones are various oral spirochaetes, certain anaerobic bacilli and cocci, supposedly inhaled with air and dust, and finally any pathogenic microörganisms which are found in the nasal and oral cavities. The fusiform bacillus, however, is constant, although it can be easily overlooked. The diagnosis of pulmonary gangrene should be made only in the presence of characteristic signs and symptoms, the putrid odor of the sputum being one of the never-failing signs. The spirochaete is not present in every case; it can not therefore be the primary cause. Two new cases of this latter type are reported.—*Deux nouveaux cas de gangrène pulmonaire,*

H. Vincent, Meeting, Acad. méd., March 8, 1927, reported in Prog. Méd., March 26, 1927, no. 13, 476.—(M. P.)

Pulmonary Gangrene.—Pulmonary gangrene is caused by the same microorganisms as the angina described by the author. Other anaerobes may be associated with Vincent's microörganisms.—*La gangrène pulmonaire, H. Vincent, Meeting, Acad. Méd., February 22, 1927, reported in Prog. Méd., March 26, 1927, no. 13, 475.—(M. P.)*

Pulmonary Gangrene of Bucco-pharyngeal Origin.—In one case, gangrene of the lung followed a submucous resection attended by considerable haemorrhage and infection of the rhinopharynx. Another patient developed the same complication following the opening of a Ludwig's angina which occurred after a dental extraction. In both cases the surgical procedures were carried out under general anaesthesia. By suppressing expulsive powers, general anaesthesia favors the bronchial penetration of infected debris. A similar complication was observed in a patient upon whom a myomectomy was performed under a general anaesthetic, and it led to the belief that a large number of so called septic postoperative emboli are really bronchial emboli of deglutition favored by the anaesthetic. These putrid foci are regarded as special types of pulmonary abscess, beginning with an ulcerating bronchoalveolitis due to spirochaetes and secondarily infected by putrefactive microörganisms.—*Les abcès gangréneux du poumon-d'origine bucco-pharyngée, E. Sergent and F. Bordet, Meeting, Acad. Méd., June 8, 1926, reported in Prog. Méd., June 19, 1926, no. 25, 959.—(U. E. Z.)*

Bacteriology of Pulmonary Gangrene.—A study of the literature and their own observations led the authors to the concept that the bacteriology of pulmonary gangrene is much more complex than represented by Vincent. Ten out of 16 cases were due to the combined action of the spirochaete and anaerobes of the type of Veillon; at the same time there exists gangrene without spirochaetes and gangrene without fusiform bacilli. The presence of spirochaetes does not necessarily mean that it is *Spirochaete Vincenti*. It has been shown that spirochaetes of entirely different characters are found in gangrenous lesions. According to the work of Comandon "the putrid symbiosis of Vincent" is not only represented by the combination of the fusiform bacillus and Vincent's spirochaetes, but that one may find associated with the spirochaetes at least 8 different types.—*Bactériologie de la gangrène pulmonaire, Bezançon and Etchegoin, Meeting, Acad., Méd., March 8, 1927, reported in Prog. Méd. March 26, 1927, no. 13, 476.—(M. P.)*

Histology of Pulmonary Gangrene.—The three layers of Carnil and Ranvier (central eschar, intermediate zone of hepatization, peripheral zone of splenization), described as at the periphery of gangrenous cavities, are not always completely present, and, in their chronic forms of pulmonary gangrene, it is difficult, if not impossible, to demonstrate histochemically the presence of fibrin. The various lesions (catarrhal, fibrinous, fibrinoleucocytic, suppurative, oedematous) of the surrounding tissues are not always schematically observed. Diffuse lesions are seen with a predominating degenerative catarrhal alveolitis, situated in the centre of a disseminated sclerosis which is more intense perivascularly. This dense sclerosis is particularly thick under the pleura and at the periphery of dilated bronchi. The parenchyma close to the cavity and below the zone of granulation is sometimes distinctly angiomatous. This is due to the approximation of numerous dilated capillaries which appear to be filled with red blood cells or are thrombosed; they are very close together but are clearly separated from one another by bands of sclerosis. Below this angiomatous zone, there are blood lakes as well as massive sclerosis. It is impossible to say from histological examination whether the angiomatous and sclerosing processes represent active lesions or reactions of defense.—*Notes histologiques sur la gangrène du poumon, G. Caussade and A. Tardieu, Meeting, Soc. Méd. d. Hôp., July 30, 1926, reported in Prog. Méd., August 4, 1926, no. 33, 1251.—(U. E. Z.)*

Cured Pulmonary Gangrene.—A severe case of pulmonary gangrene was cured following the administration of hyposulphites, arsenobenzol, and antigangrene serum. The patient received 8 litres of serum with no bad effects. Spirochaetes and anaerobes were found in the expectorated material. *Perfringens* microörganisms were absent.—*Gangrène pulmonaire guérie, Loeper and Garcin, Meeting, Soc. Méd. d. Hôp., July 23, 1926, reported in Prog. Méd., July 31, 1926, no. 31, 1191.—(U. E. Z.)*

Spirochaetal Pulmonary Gangrene.—In discussing a case of chronic pulmonary gangrene, great stress is laid upon the rôle of the spirochaete in the development of the disease. In certain cases the difficulties in

diagnosis between bronchial dilatation and gangrene are made understandable by the pathological findings.—*Forme chronique de gangrène pulmonaire a spirochètes, Bezançon, Moreau and Bernard, Meeting, Soc. Méd. d. Hôp., July 23, 1926, reported in Prog. Méd., July 31, 1926, no. 31, 1191.*—(*U. E. Z.*)

Chronic Spirochaetal Pulmonary Gangrene.—In a patient with a negative history for tuberculosis and syphilis, the onset of her illness was sudden, following a full-term delivery. The clinical course was marked by numerous remissions, and with each attack there was a considerable increase in the amount of expectoration, high fever and poor general condition. Toward the end, large numbers of spirochaetes were present in the sputum (more than 200 per field). Haemoptyses were frequent. All therapeutic measures (pneumothorax, arsenical preparations, antigangrene serum) were futile. At autopsy many large gangrenous cavities were found. There were recent multiple foci of bronchopneumonia due to a series of small gangrenous bronchial emboli. Marked sclerosis was found around the bronchi and cavities. The pulmonary parenchyma in certain parts presented a lobulated appearance due to the sclerosis. In these sclerotic areas a certain degree of bronchial dilatation and new formation of vascular tissue was noted. Only the bronchi of microscopic size were dilated. The fibrosis and tissue mortification present makes the condition comparable to the fibrocaseous process in phthisis. By means of photomicrographs the presence of innumerable spirochaetes was demonstrated in the walls of the gangrenous cavities. The central portion of the cavities contained many anaerobic microörganisms, fusiform bacilli and a number of leptothrix. This observation is the third one in the French literature, in which the presence of spirochaetes was demonstrable in the histological sections of the cavity wall. In a large number of cases of pulmonary gangrene, the process is primarily due to the action of spirochaetes with a secondary invasion by aerobes and anaerobes, fusiform bacilli and leptothrix.—*Étude clinique, microbiologique, et histopathologique d'un cas de gangrène pulmonaire à spirochète, a évolution chronique, Bezançon, Etchegoin, Azoulay and Bazgan, meeting, Soc. Méd. d. Hôp., May 20, 1927, reported in Prog. Méd., June 8, 1927, no. 25, 958.*—(*U. E. Z.*)

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